

Air Quality Permitting Program Bureau of Technical Services

Technical Manual 1005

Guidelines for Continuous Emissions Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS)

For technical questions on this manual, call:
Bureau of Technical Services at (609) 530-4041

E-mail: xyyyyyyy@dep.state.nj.us

Where x – first letter of first name
y – first seven letters of last name

New Jersey Department of Environmental Protection

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I. INTRODUCTION

This manual is not intended to provide step-by-step instructions on designing, selecting, installing or performance testing CEMS/COMS. It does contain design specifications, performance specifications, performance test procedures, data storage and reporting requirements, quality assurance criteria, and administrative procedures for obtaining Department approval of CEMS/COMS.

Each proposed CEMS/COMS will be evaluated on an individual basis. No list of approved equipment will be maintained by the Department. Final approval will be contingent upon the system meeting performance standards established by the New Jersey Department of Environmental Protection (NJDEP). **The standards, while based on those established in the Code of Federal Regulations, have been modified in order to meet the specific needs of the NJDEP in enforcing its rules and regulations.** Requests to deviate from the requirements specified in this guideline must have prior written approval from the Bureau of Technical Services. Such requests will be reviewed on a case-by-case basis and must include a sufficient justification. Requests submitted without sufficient justification will not be approved.

The CEMS/COMS approval process consists of four phases: The CEMS/COMS equipment protocol review, the Performance Specification Test (PST) protocol review, PST report review; and the development of a Quality Assurance (QA) and Preventive Maintenance (PM) plan. Specifications for each are included in this manual.

(NOTE: Effective **July 1, 2001**, all CEMS/COMS equipment protocols or revisions and all Performance Specification Test Protocols or revisions shall meet the requirements specified in this guideline).

II. APPLICABILITY

This guideline is intended to be implemented for source operations which are required to install and operate CEMS/COMS for any one or more of the following regulations.

New Jersey Administrative Codes (N.J.A.C.)

- N.J.A.C. 7:26 and N.J.A.C. 7:27

Federal Requirements for Preparation, Adoption and Submittal of Implementation Plans
40 CFR - Part 51;

Federal New Source Performance Standards (NSPS), 40 CFR - Part 60;

Federal National Emission Standards for Hazardous Air Pollutant (NESHAPS), 40 CFR - Part 61;

Federal Acid Rain Requirements, 40 CFR - Part 75;

Federal Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal
Facilities (RCRA), 40 CFR - Part 264;

Federal Standards for the Management of Specific Types of Hazardous Waste Management Facilities
(BIF), 40 CFR - Part 266;

Federal Standards for the Use or Disposal of Sewerage Sludge, 40 CFR - Part 503;

Federal Polychlorinated Bi-Phenyls (PCBS) Manufacturing Processing, Distribution in Commerce
and use Prohibitions (TOSCA), 40 CFR - Part 761.

III. DEFINITIONS

CEMS (Continuous Emission Monitoring System) - The total equipment required for the determination of a gas concentration or emissions rate. The system consists of the following major subsystems; sample interface, pollutant analyzer, diluent analyzer (if applicable), fuel flow monitors (if applicable) and data recording and storage devices.

COMS (Continuous Opacity Monitoring System) - The total equipment required for the determination of the opacity of emissions which meets the minimum requirements of Performance Specification One of 40 CFR - Part 60 and EPA Proposed Method 203.

(Note: Definitions of most terms are located in each individual section of each federal rule).

IV. MINIMUM SPECIFICATIONS FOR CEMS/COMS

A. Minimum Requirements

The following list of performance requirements may be applicable to any CEMS or COMS required to be installed by one or more regulations identified in Section II.

1. Opacity
40 CFR - Part 51
Reference Method 203 and;
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 1
2. Sulfur Dioxide (SO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 2
40 CFR - Part 75 - Appendices A and D
3. Nitrogen Oxides (NO_x as NO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 2
40 CFR - Part 75 - Appendices A and E
4. Oxygen (O₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 3 (except for those sources effected by BIF).
40 CFR - Part 75 - Appendix A
5. Carbon Dioxide (CO₂)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 3
40 CFR - Part 75 - Appendices A and G
6. Carbon Monoxide
40 CFR - Part 60 - Appendix B
Performance Specification Test 4 (MWC are required to meet PST 4A; BIF Sources required to meet 40 CFR - Part 266).
7. Continuous Emission Rate Monitors
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 6
40 CFR - Part 75 - Appendix A

8. Total Reduced Sulfur (TRS)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 5
9. Hydrogen Sulfide (H₂S)
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 7
10. Volatile Organic Compounds (VOC) CEMS
40 CFR - Part 60 - Appendix B
Performance Specification Test No. 8
11. Gas Chromatographic CEMS
Performance Specification Test No. 9
40 CFR - Part 266 and
40 CFR - Part 503
12. Extractive FTIR CEMS
Performance Specification Test No. 15

B. Additional CEMS/COMS Equipment Requirements

In addition to the equipment specifications referenced in Section IV.A., the following equipment specifications will also apply.

1. General Requirements

- a. CEMS/COMS equipment protocol is required to be submitted to the Bureau of Technical Services (BTS) in the format specified in Appendix A. The CEMS/COMS equipment protocol must be approved by the Bureau of Technical Services prior to conducting the required Performance Specification Tests (PST). It is recommended that the CEMS/COMS equipment protocol be submitted to BTS for approval, prior to the purchase/ordering of such equipment.
- b. The temperature at the exit of the conditioning system for any gaseous CEMS must not exceed 44° F. This temperature must be continuously monitored and continuously recorded. This may be accomplished by recording the actual temperature or an alarm status. If the conditioner utilizes something other than a chiller to remove moisture, the dew-point of the gas exiting the conditioner must be monitored in the same manner.
- c. Time-sharing of a CEMS with multiple sources is only acceptable in cases where back-up or secondary sources are utilized when primary sources are off-line (non-operational). In such cases, each source must have an independent sample probe and sample transport system.
- d. Any gaseous analyzer installed in a CEMS must have a minimum accuracy, as published by the manufacturer, of plus or minus one percent of the operating range.
- e. Fuel Flow analyzers must comply with the requirements outlined in 40 CFR, Part 75, Appendix D.

2. Calibration Requirements

- a. Calibration Gas Introduction Point - All calibration gases are required to be introduced into the CEMS at the sample probe, no further downstream than the immediate exit of the sample probe.

- b. CEMS calibration is that period of time which occurs once every 24 hours and is to have both high span and zero gases introduced. This period shall be of sufficient duration to demonstrate the required instrument response time, instrument drift and shall include any adjustments (if necessary). If, during any hourly averaging period, the time required to complete the calibration cycle exceeds fifteen (15) minutes for any analyzer, in units of the standard (i.e. ppm at 7% O₂), then that hourly period shall be included in the downtime calculation for that parameter. If the standard requires data from two or more analyzers, the calibration of each analyzer must be completed within the same fifteen (15) minute period. Only one calibration period of less than 15 minutes may be excluded from the downtime requirement for any 24 hour period.
- c. COMS Calibration is that period of time, which occurs once every 24 hours and is to include both span and zero filters.
- d. Calibration of all CEMS is to be conducted once every twenty-four (24) hours. This calibration procedure must include the introduction of a high span calibration standard (80% to 90% of operating range) and a zero gas. For oxygen analyzers which can not utilize a true zero gas, a gas standard containing an oxygen concentration no greater than two (2) percent will be allowed. This non-zero oxygen standard must be indicated in the CEMS Equipment Protocol.
- e. Zero gas is required to be introduced first then the high range calibration standard.
- f. Non-methane total hydrocarbon analyzers, if approved for use, must be calibrated with a gas that contains a blend of methane and propane. The methane concentration must be no more than 10 percent of the propane concentration expressed as methane. The propane concentration shall be selected in accordance with item d. above.
- g. All calibration gases must have a minimum certified accuracy of plus or minus two percent of the cylinder label value unless a higher standard is required by regulation.
- h. The quality of the calibration gas is considered an integral part of the CEMS. Accordingly, the quality of the calibration gas utilized, for the daily CEMS calibration, during the certification test program, shall be the minimum quality acceptable until the next annual RATA test. Reducing the quality of the calibration gas after the certification program is not acceptable.

3. Data Recording and Storage Requirements

- a. A strip chart recorder is required as a minimum data reduction device for all CEMS/COMS. A minimum chart speed of sixty (60) mm per hour (faster if necessary to insure proper resolution of CEMS data) is required. The Department recommends the use of a Data Acquisition System (DAS) to reduce CEMS data for quarterly Excess Emission and Monitoring Performance Reports (EEMPRs).
- b. Round chart recorders are only acceptable for instantaneous limits and will not be approved when the applicable limit is expressed as an average of data over a specified time period.
- c. All strip chart recorders must automatically record the date along with the CEMS data.
- d. Any computerized Data Acquisitions System (DAS) which is utilized without a strip chart recorder must have the capability of producing historical and present one-minute data averages both visually (on screen) and graphically (hard copy).
- e. One-minute CEMS/COMS data must be retained for a period of one calendar quarter from the date of EEMPR submission. After that date, only applicable averages in units of the standard (example: PPM Hourly average) and all periods of emission exceedences must be stored for the time period specified in the permit.

4. Valid Data Capture Requirements

- a. CEMS installed and operating for measurement of gaseous emissions, shall complete a minimum of one (1) cycle of operation, which includes sampling, analyzing and data recording for each successive one (1) minute period.
- b. CEMS must provide a minimum of seventy-five (75) percent (45 minutes of one-minute data averages for each one hour (60 minute) clock period.
- c. For any one hour (60 minute) period where less than forty-five (45) minutes of CEMS/COMS data is provided for any analyzer, the entire sixty (60) minute period is considered downtime for that analyzer and shall be included in the quarterly EEMPR as downtime.

- d. All CEMS must provide for a minimum of ninety (90) percent valid data capture, in units of the standard, for each calendar quarter, based on source operating time (unless otherwise specified by regulation).
 - e. All COMS must provide for a minimum of ninety-five (95) percent valid data based on source operating time for each calendar quarter, based on source operating time (unless otherwise specified by regulation).
 - f. Downtime includes those periods where the CEMS or COMS are not providing compliance emission data while the process is in operation. It also includes periods of Quality Assurance (QA) and Preventive Maintenance (PM) procedures and CEMS calibration (if calibration period exceeds 15 minutes in any one hour). All downtime is to be recorded on the quarterly EEMPR form.
 - g. If the percent data availability percentage for any CEMS/COMS analyzer cannot be made for two (2) consecutive calendar quarters the facility shall implement the following items:
 - i. Install a replacement CEMS approved by BTS within one-hundred and eighty (180) calendar days following the end of the second quarter failure.
 - ii. Provide a temporary alternative within thirty (30) days which shall be reviewed and approved by BTS to monitor the compliance status of the emissions source.
 - iii. Items a and b above do not relieve any facility from any permit condition which requires the source to be shutdown in the event of a CEMS failure.
 - h. If the permit conditions for a given facility allow for startup and shutdown exclusions, calculations of percent valid data capture shall not include the excluded periods.
5. Stack Gas Volumetric Flow Monitoring

All stack gas volumetric flow measuring devices, required to be installed, shall meet the following requirements:

- a. A differential pressure flow monitor shall have an automatic blow-back purge system.

- b. If a differential pressure flow monitoring device is installed in wet stack conditions, the system shall have the capability for drainage of sensing lines.
- c. The stack gas flow monitoring system shall have the capability for on-line manual transducer calibration and for a zero check.
- d. The stack gas flow monitoring system shall be capable of displaying the individual parameters used in the stack gas flow calculation.

V. PERFORMANCE SPECIFICATION TESTS

- A. A Performance Specification Test (PST) protocol is required to be submitted to and approved by BTS for any CEMS/COMS required by any Federal or State Regulation as well as NJDEP permit conditions.
- B. A PST is required when any integral part of the CEMS is replaced or repaired. An integral part includes items such as, but not limited to, sample conditioners, data recording devices, analyzer detectors, circuit boards or any component which directly influences the concentration output readings.
- C. The PST protocol must outline the procedures and equipment which shall be utilized for the certification test program to insure that all CEMS/COMS data is accurate and representative.
- D. PST tests are not to be conducted until after the PST protocol has been approved by BTS.
- E. PSTs shall follow the applicable procedures referenced in Section III.A. with the following additions:
 - 1. Relative Accuracy (RA) tests shall be conducted during the Calibration Drift (CD) test period. It is recommended that the RA tests be conducted during the latter half of the CD test period.
 - 2. A facility must notify BTS in writing at a minimum of thirty (30) calendar days prior to conducting the PSTS.
 - 3. The final PST report shall be submitted to BTS within thirty (30) calendar days of completion of the PSTS.
 - 4. All CEMS/COMS shall successfully complete the PSTs. The final PST report must be submitted to BTS prior to conducting any compliance stack emission tests. The Department may waive this requirement if the facility provides an appropriate written justification to the Supervisor/CEMS Program.
 - 5. The PST report must include the serial number of each analyzer and data recording device.
 - 6. Each PST report must be certified in accordance with N.J.A.C. 7:27-1.39(a)1 and 2 and must include the certification language specified therein.
 - 7. The report must include RA calculations for raw concentrations as well as units of the standard.

- F. All redundant CEMS/COMS installed to insure the minimum data availability requirement must undergo the appropriate PSTs.

- G. Data from the CEMS/COMS becomes enforceable upon the completion date of a successful certification test. Accordingly, the facility shall implement the minimum Quality Assurance/Quality Control procedures, which follow in Section VI, immediately following the successful certification test.

VI. QUALITY ASSURANCE (QA) / QUALITY CONTROL (QC)

- A. A QA/QC plan is required to be developed for all CEMS/COMS required in Section II of this document. This QA/QC plan shall incorporate at a minimum those procedures outlined in 40 CFR, Part 60, Appendix F and/or 40 CFR, Part 75, Appendix B for CEMS and those procedures outlined in 40 CFR, Part 60, Appendix B, Specification One and 40 CFR, Part 51, Proposed RM 203 for COMS.
- B. The QA/QC plan shall designate a coordinator for the facility who is responsible to ensure that the QA/QC plan specified in VI.A is implemented.
- C. The QA/QC coordinator shall be responsible for reviewing the QA/QC plan specified in VI.A. on an annual basis. Any changes to the QA/QC plan shall be submitted in writing to the Supervisor/CEMS Program in the Bureau of Technical Services.
- D. All quarterly and annual QA data shall be included in quarterly EEMPR reports and kept on file with the facility. The QA data must be made available upon request.
- E. All procedures outlined in the QA plan specified in Section VI.A above shall commence upon the completion date of the PST.
- F. The Department reserves the right to require the QA/QC plan to be revised at any time based on the results of quarterly EEMPR reviews, inspections, audits or any other information available to the Department.
- G. All redundant CEMS/COMS must undergo the QA/QC procedure specified in the source QA/QC manual specified in Section VI.A.

VII. PREVENTIVE MAINTENANCE

- A. A Preventive Maintenance (PM) plan must be developed for each CEMS/COMS equipment protocol. The PM plan must include all procedures and/or spare parts necessary to insure the CEMS/COMS data valid capture requirements specified in Section IV.B.4.
- B. The Preventive Maintenance (PM) plan shall be reviewed on an annual basis by the QA coordinator designated in accordance with Section VI.B. Any changes to the PM plan shall be submitted to the Supervisor/CEMS program at the Bureau of Technical Services.
- C. All redundant CEMS/COMS must undergo the preventive maintenance procedures specified in the source PM plan specified in Section VII.A.

VIII. CEMS/COMS PERFORMANCE AND EMISSIONS REPORTING

- A. A quarterly report of CEMS/COMS performance and emission exceedances is required to be submitted to the appropriate Regional Enforcement Office (REO) for the facilities location. The geographic coverage area for each REO is located in Appendix C. This report shall be submitted to the appropriate REO whether or not an emission exceedance has occurred.
- B. The quarterly report specified in Section VIII.A. must be submitted to the REO within thirty (30) calendar days of the end of each calendar quarter.
- C. The format for the quarterly report is indicated in Appendix B. Approval of any other format shall be made through the REO having jurisdiction over the facility.
- D. Submittal of CEMS/COMS quarterly reports shall commence to the Appropriate Regional Enforcement Office upon installation of the CEMS.
- E. Certified CEMS/COMS data will be utilized for compliance with applicable emission limits or emission standards beginning on the completion date of the successful certification test.
- F. Any CEMS/COMS which does not successfully demonstrate that the equipment meets the appropriate PST, after two PST attempts, shall implement the following:
 - 1. Install a replacement CEMS/COMS approved by BTS within one hundred and eighty days (180) calendar date following the rejection of the second PST results.
 - 2. Provide a temporary CEMS/COMS within thirty (30) calendar days that is reviewed and approved by BTS to monitor the compliance status of the source.

APPENDIX A

PROTOCOL FOR CONTINUOUS EMISSION MONITORING SYSTEMS

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF TECHNICAL SERVICES

PROTOCOL FOR CONTINUOUS EMISSION MONITORING SYSTEMS

The following is a list of information to be submitted to the Bureau of Technical Services for installation of Continuous Emission Monitoring Systems (CEMS). This information is necessary to evaluate the monitoring system and to determine if it will be acceptable to the Department. Failure to respond to any one item will result in the Department not approving the monitoring system.

- 1) Submit name of manufacturer and model number of each individual analyzer proposed.
- 2) Indicate principal of operation of each analyzer.
- 3) Indicate the range of operation at which each analyzer will be used.
- 4) Indicate the manufacturer and concentration of all calibration standards for each individual analyzer.
- 5) Indicate where calibration standards are introduced into the CEMS.
- 6) Indicate the calibration schedule proposed for each analyzer. Indicate where calibration standards are introduced into the CEMS.
- 7) Indicate the percentage of valid data captured (or percent downtime) for any calendar quarter, based on source operation time.
- 8) Provide written Quality Assurance practices for each CEMS.
- 9) Describe the routine maintenance schedule for each analyzer (daily, weekly, monthly, quarterly, yearly).
- 10) Indicate and describe the type of sample transport system, (if applicable).
- 11) Indicate and describe the type of sample conditioning system, (if applicable). Indicate the temperature range (°F) at exit of sample conditioner. Specify if this temperature is continuously monitored and recorded.
- 12) Submit name of manufacturer and model of each data recording device.

- 13) Indicate if the data recorder is a strip chart, round chart recorder or data acquisition system (DAS). If a data acquisition system is utilized, does it store one minute data averages and graphically trends one-minute data.
- 14) Indicate the number of parameters (if applicable) the recorder or DAS is monitoring.
- 15) Indicate the speed of the recorder. If no DAS is utilized, provide information on how data will be reduced for excess emission reports, if required.
- 16) Submit a schematic of the source being monitored indicating location of the following items:
 - i.) Sampling point of the monitoring system.
 - ii.) Introduction point of calibration standards.
 - iii.) Placement of the monitor(s).
 - iv.) Placement of the data recorder(s).

The Bureau of Technical Service requests that a copy of the manufacturers original technical specification brochure be submitted along with the listed information.

All correspondence to this office must include the name of the company where the CEMS are to be installed and the NJEMS PCP Identification number, APC Plant ID Number and Stack Number. Failure to provide this information can delay the review of the proposed system.

Any questions regarding this information can be directed to:

US MAIL

New Jersey Department of Environmental Protection
Bureau of Technical Services
ATTN: CEMS Coordinator
CN 437
Trenton, New Jersey 08625-0437
(609) 530-4041

SHIPPING ADDRESS

New Jersey Department of Environmental Protection
Bureau of Technical Services
ATTN: CEMS Coordinator
380 Scotch Road
West Trenton, NJ 08628

APPENDIX B

EEMPR FORMAT

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

**EXCESS EMISSIONS AND MONITORING PERFORMANCE REPORT FOR
CONTINUOUS MONITORING SYSTEMS**

This form is to be used for quarterly reporting of the following Continuous Monitoring Systems (CMS):

- Continuous Emission Monitoring Systems (CEMS)
- Continuous Opacity Monitoring Systems (COMS)

The Excess Emission and Monitoring Performance Reports (EEMPRs) are due to the NJDEP regional enforcement office within 30 days of the end of each calendar quarter. This means that the report must be postmarked within this time period.

IMPORTANT: THIS REPORT MUST BE SUBMITTED EVEN IF NO EMISSION EXCEEDANCES OR OTHER PARAMETER VIOLATIONS OCCURRED.

The EEMPR is structured so that a facility with multiple CMSs can submit all the necessary data in one form for each source. Therefore, there may be sections of the EEMPR which ask for information not applicable to the source's monitor operation. If such information is not applicable, please indicate so in the spaces provided.

The EEMPR is composed of four parts:

1. FACILITY AND SOURCE INFORMATION
2. MONITOR INFORMATION
3. SOURCE AND MONITOR DOWNTIME INFORMATION
4. EMISSION EXCEEDANCE INFORMATION

Please submit the computer RATA package and any other information relative to calibration error, yearly performance tests, and other tests and procedures, as required by applicable permit conditions.

In addition, if the facility is required to conduct the following analyzer accuracy assessment tests, please submit the summary page of the results:

For CEMS:

- _____ Relative Accuracy Test Audits (RATA)
- _____ Cylinder Gas Audits (CGA)
- _____ Calibration Error (CE)
- _____ Yearly Performance Test
- _____ Other: specify _____

For COMS:

- _____ Calibration determination error
- _____ Response time determination
- _____ 24 hour zero calibration drift determination

1. FACILITY AND SOURCE INFORMATION

A. Reporting period ending (circle): March 31 June 30 September 30 December 31
Year _____ Number of days in reporting period _____

B. Company Name _____

Mailing Address _____

Plant Location _____

Contact Person _____ Phone _____

Title _____

SOURCE INFORMATION

Source Designation _____

Plant ID # _____ NJ Stack ID # _____ Certificate # _____ Log # _____

Total **SOURCE HOURS OF OPERATION** during reporting period: _____

Type of control device(s) operated _____

C. **CERTIFICATION**

To be completed by CMS Coordinator (highest ranking official with direct knowledge of the contents of this report):

I certify under penalty of law that the information provided in this document is true, accurate, and complete. I am aware that there are significant civil and criminal penalties, including fines or imprisonment or both, for submitting false, inaccurate, or incomplete information.

Name (Print) _____

Title _____

Signature _____

Date _____ Phone _____

2. MONITOR INFORMATION

| A. GENERAL MONITOR INFORMATION | ANALYZER 1 | ANALYZER 2 | ANALYZER 3 | ANALYZER 4 |
|--|-------------------|-------------------|-------------------|-------------------|
| EMISSION OR PARAMETER MONITORED | | | | |
| MANUFACTURER | | | | |
| MODEL # | | | | |
| SERIAL # | | | | |
| OPERATING RANGE (specify units) | | | | |
| SPAN LEVEL CALIBRATION | | | | |
| INSTALLATION DATE | | | | |
| START UP DATE | | | | |
| EMISSION/PARAMETER STANDARD (inc. units) | | | | |
| AVERAGING TIME | | | | |
| HOURS OF OPERATION | | | | |

| | | | | |
|-----------------------|--|--|--|--|
| FINAL DATE OF PST | | | | |
| DATE OF CERTIFICATION | | | | |

| B. RELATIVE ACCURACY TEST AUDIT DATA | ANALYZER 1 | ANALYZER 2 | ANALYZER 3 | ANALYZER 4 |
|---|-------------------|-------------------|-------------------|-------------------|
| DATE OF RATA | | | | |
| REFERENCE METHODS USED (i.e. RM3, etc.) | | | | |
| AVERAGE RM VALUE | | | | |
| AVERAGE CEMS VALUE | | | | |
| ABSOLUTE VALUE OF MEAN DIFFERENCE | | | | |
| CONFIDENCE COEFFICIENT | | | | |

| | | | | |
|---------------------|--|--|--|--|
| % RELATIVE ACCURACY | | | | |
|---------------------|--|--|--|--|

2. MONITOR INFORMATION

| C. CYLINDER GAS AUDIT DATA | | ANALYZER 1 | ANALYZER 2 | ANALYZER 3 | ANALYZER 4 |
|---|------|-------------------|-------------------|-------------------|-------------------|
| DATE OF AUDIT | | | | | |
| CYLINDER ID# BY POLLUTANT | HIGH | | | | |
| | LOW | | | | |
| DATE OF ALL CYLINDER GAS CERTIFICATION | HIGH | | | | |
| | LOW | | | | |
| TYPE OF CERTIFICATION FOR ALL CYLINDERS | HIGH | | | | |
| | LOW | | | | |
| CERTIFIED AUDIT VALUE FOR EACH CYLINDER | HIGH | | | | |
| | LOW | | | | |
| CEMS RESPONSE VALUE | HIGH | | | | |
| | LOW | | | | |
| % ACCURACY | HIGH | | | | |
| | LOW | | | | |

D. AMMONIA, HCl, AND TOTAL HYDROCARBON MONITORS

| | | | | | |
|-------------------|------|--|--|--|--|
| CALIBRATION ERROR | HIGH | | | | |
| | LOW | | | | |
| CALIBRATION DRIFT | HIGH | | | | |
| | LOW | | | | |
| RESPONSE TIME | HIGH | | | | |
| | | | | | |

| | | | | | |
|--|-----|--|--|--|--|
| | LOW | | | | |
|--|-----|--|--|--|--|

_____ Check if continued on next page

2. **MONITOR INFORMATION (cont.)**

E. CONTINUOUS OPACITY MONITORS DATA ASSESSMENT

Performance Audit: Date Conducted _____

1. Stack Exit Correlation Error

- a) Actual pathlength correction factor _____
- b) Correct pathlength correction factor _____
- c) Stack Exit Correlation Error _____

2. Active Fault Indicators: error messages present:

3. Zero and Upscale Calibration Check Responses

| | Correct Value | Response | Difference |
|---------|---------------|----------|------------|
| Zero | | | |
| Upscale | | | |

4. Zero Compensation Value (percent opacity): _____

5. Optical Alignment Status: _____

6. Dust Accumulation on Optical Surfaces _____

| | Initial Opacity | Final Opacity | Difference |
|----------|-----------------|---------------|------------|
| Window 1 | | | |
| Window 2 | | | |
| Total | | | |

7. Calibration Error

a) Filter Values (equivalent opacity)

Low _____

Mid _____

High _____

E. CONTINUOUS OPACITY MONITORS DATA ASSESSMENT (cont)

7. Calibration Error (cont)

b) Test Results

| | Low | Mid | High |
|---|-----|-----|------|
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

c) Calibration Error

Low _____

Mid _____

High _____

Zero Alignment Audit

1. Clear Path Zero Response _____ % opacity
2. Simulated Zero Response _____ % opacity
3. Zero Alignment Error _____ % opacity
4. Zero Error of Previous Two (2) Assessments _____ _____

3. **SOURCE AND MONITOR DOWNTIME INFORMATION**

| | DATE | START OF DOWNTOWN | END | DURATION | REASON | CORRECTIVE ACTION |
|---------------|------|-------------------|-----|----------|--------|-------------------|
| SOURCE | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

TOTAL HOURS OF DOWNTIME

| | | | | | | |
|----------------------------|--|--|--|--|--|--|
| ANALYZER 1 _____ | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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TOTAL HOURS OF DOWNTIME

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TOTAL HOURS OF DOWNTIME

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| ANALYZER 3 _____ | | | | | | |
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TOTAL HOURS OF DOWNTIME

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| ANALYZER 4 _____ | | | | | | |
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TOTAL HOURS OF DOWNTIME

CHECK IF CONTINUED ON ADDITIONAL PAGES _____

4. EMISSION EXCEEDANCE INFORMATION

| 1 DATE OF EXCEEDANCE | 2 EMISSION OR PARAMETER | 3 PERMIT ALLOWABLE | 4 UNITS | 5 AVERAGING TIME | 6 EXCEED- ANCE START TIME END | | 7 DURATION (0.0 HR) | 8 EMISSION OR PARAMETER READING | 9 PERCENT DEVIATION FROM ALLOWABLE | 10 REMARKS |
|-------------------------|----------------------------|-----------------------|------------|---------------------|---|--|------------------------|------------------------------------|---------------------------------------|---------------|
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**INSTRUCTIONS FOR COMPLETING
EXCESS EMISSIONS AND MONITORING PERFORMANCE
REPORT**

1. FACILITY AND SOURCE INFORMATION

- A. Specify the reporting quarter and the year. Include number of days in that quarter.
- B. This information can be obtained from the Certificate to Operate.
- C. The certification statement is written as it appears in N.J.A.C. 7:27-1.39.

2. MONITOR INFORMATION

A. GENERAL MONITOR INFORMATION

Emission or Parameter Monitored - space is provided for four monitor systems. Use additional sheets if necessary. List each analyzer by the emission it is monitoring.

Emission or Parameter Monitored - space is provided for four monitor systems. Use additional sheets if necessary. List each analyzer by the emission it is monitoring.

Manufacture, Model #, Serial #, Operating Range, and Span Level

Calibration - enter this information as it appears on your equipment protocol which was approved by BTS.

Installation Date - the date each monitor was originally installed.

Start-Up Date - the date the system began operating (before the PST).

Emission/Parameter Standard - the permitted allowable emission rate in parts per million or %. Example: CO = 50 ppm. If a stack gas flow meter is installed and properly operating and has been approved by BTS, the emission allowable may be reported in lbs/hour if required by Certificate.

Averaging Time - as appears in conditions of the permit/certificate. It will be rolling or block averages as defined below. Block averaging may be requested in writing from BTS.

Hourly Rolling Averages - The CEMS shall calculate every minute, an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

Block Averaging - For averaging times of one hour or greater, block averaging will be used to measure the average beginning on the hour. For parameters with averaging time of less than one hour, averaging will measure the parameter by beginning on the hour and continuing by subsequent increments of the parameters averaging time.

Hours of Operation - the total number of hours the CEMS operated while the source was in operation for the reporting quarter.

Date of PST - Report the date of the last day of the successful test.

Date CEMS Certified - date of the completion of a successful PST.

B. RELATIVE ACCURACY TEST AUDIT DATA

Obtain this information from the audit results which will include calibration gas certification, reference methods, calculations, etc. Include copy of the Summary Sheet from RATA. The RATA must be conducted at least once every four calendar quarters.

C. CYLINDER GAS AUDIT DATA

Obtain this information from the Cylinder Gas Certificate and the Audit Summary Sheet. See 40 CFR Part 60 Appendix F for CGA procedures. Include a copy of the Summary Sheet from the CGA. The CGA may be conducted in three of four calendar quarters, but in no more than three quarters in succession.

D. AMMONIA, HYDROGEN CHLORIDE AND TOTAL HYDROCARBON MONITORS

These monitors require similar audit information as all other gaseous monitors

A Calibration Error (CE) test may be conducted in no more than three (3) consecutive quarters; a Performance Specification Test must be conducted annually. The PST test consists of a Calibration Error Test, a Calibration Drift Test, and a Response Time Test.

E. OPACITY ANALYZER ACCURACY ASSESSMENT

Report the month, day and year of the quarterly audit. Refer to CFR Part 51 Method 203 to complete Sections 2 through 7.

3. SOURCE AND MONITOR DOWNTIME INFORMATION

A. Source is considered to be down when no contaminants are being emitted or generated by any source operation or the control equipment. Only those periods of unscheduled downtime such as periods when the source or control device is non-operational due to equipment failure or malfunction should be reported. Do not report that time when the source is inactive due to regularly scheduled downtime such as holiday vacation or after-hours shutdown periods.

B. Analyzer downtime is any time the monitors are not collecting and recording valid emission data while the source or control device is operating. This includes daily calibrations which exceed 15 minutes in any one clock hour, Appendix F QA/QC activity (i.e., RATA, CGA, RAA), monitor out-of-control periods as defined in 40 CFR Part 60 Part 60 Appendices B & F, and normal or preventative maintenance.

(Note: Definition of analyzer downtime is in the EEMPR Definitions section).

Any CEM downtime which exceeds 15 minutes shall be deemed down for the entire hour, for block averages; CEM downtime for rolling averages must be reported in minutes.

Downtime of any diluent analyzer used in conjunction with an emission analyzer shall result in both analyzers being considered down until that time when both (or all) analyzers are operating simultaneously.

4. EMISSION EXCEEDANCE INFORMATION

INSTRUCTIONS FOR REPORTING EXCEEDANCES

| COLUMN | EXPLANATION |
|--------|--|
| 1 | Enter the date the exceedance occurred. |
| 2 | Enter the monitored emission or parameter which was exceeded. |
| 3 | Enter the permit allowable emission concentration limit of the emission or parameter listed in Column 2. Example: For a 2 hour period beginning 12:00 and ending 14:00, the average concentration of NO_x in the stack gas was 400 ppmvd at 13:00 and 14:00, exceeding the permit allowable limit of 300 ppmvd @ 7% O₂. Enter 300 in Column 3. |
| 4 | Enter the units of measurement for the contaminant or parameter, as listed in the permit. For opacity, enter AOPACITY@ For the example listed in #3 above, enter “ppmvd” in Column 4. |
| 5 | Enter the averaging time allowed by the permit for the emission or parameter listed in Column 2, if applicable. For the example given in #3 above, enter 1:00. |
| 6 | If the emission has a block averaging time: The start time is the beginning of the averaging |

period showing the exceedance, and the end time is the end of that averaging period. If the total exceedance time is greater than the averaging time, it will require separate line item entries on the EEMPR. Use military time.

For the example given in #3 above, on one line, enter 12:00 in the “START” column and 13:00 in the “END” column; on the following line, enter 13:00 in the “START” column and 14:00 in the “END” column.

If the emission has a rolling averaging time: Enter the time (“START”) it exceeded the permit allowable, and the time (“END”) it returned to the permit allowable limit.

For the example given in #3 above, on one line, enter 12:00 in the “START” column and 14:00 in the “END” column.

7 **If the emission has a block averaging time:** Enter the averaging time, in decimal hours.

For the example given in #3 above, enter 1.0 as the duration for each of the one hour exceedances.

If the emission has a rolling averaging time: Enter the total time that the rolling average exceeded the permit allowable, in decimal hours.

For the example given in #3 above, enter 2.0 as the duration for each of the one hour exceedances.

8 **If the emission has a block averaging time:** Enter the total time that the rolling average exceeded the permit allowable, in decimal hours.

For the example given in #3 above, enter 2.0 as the duration for each of the one hour exceedances.

If the emission has a rolling averaging time: Enter the average emission exceedance for the duration of the incident, in decimal hours.

For the example given in #3 above, enter the average exceedance in Column 8.

For OPACITY, see REPORTING OPACITY EXCEEDANCES below.

9 **For all emission exceedance except oxygen and opacity:** Enter the percent over the permit allowable using the following formula:

$$\frac{\text{Column (8)} - \text{Column (3)}}{\text{Column (3)}} \times 100\%$$

For minimum oxygen concentration exceedances: Enter the percent of the minimum oxygen concentration using the following formula:

$$1 - \frac{\text{Column (8)} - \text{Column (3)}}{\text{Column (3)}} \times 100\%$$

For opacity: enter N/A

10 Enter any remarks relating to the reported exceedance, such as cause or remedial action.

REPORTING OPACITY EXCEEDANCES

Reporting Opacity Exceedances for Sources NOT regulated by NJAC 7:27-3

Provisions in this Technical Manual 1005, concerning "No Visible Emissions (NVE)", supersede any DEP Technical Manual, including Manual #1410, page 9, which may have established NVE to mean anything other than: opacity not greater than 5 percent.

Opacity is required to be measured by a six minute averaging method; an emission exceedance is said to have occurred after the six minute average value exceeds the permit allowable. A continuous opacity exceedance is an incident in which consecutive six minute average readings are greater than the permit allowable. Such an incident should be reported in the form of six minute block averages (i.e., separate line item entries for each six minute average).

Example: A cogeneration plant subject to the opacity provisions in its permit cannot exceed 10% opacity in any 6 minute block period. From 15:03 to 15:33, the six minute average opacity readings from this source were 12%, 20%, 35%, etc.

On one line of the EEMPR:

In Column 5, enter 00.06.

In Column 6, enter 15:03 in "START", and 15:09 in "END".

In Column 7, enter 0.1 (6 minutes /60 minutes)

In Column 8, enter 12%, the six minute average for the first six minutes of the exceedance.

On the subsequent lines, enter the next 6 minute averages which exceed the limit.

Procedure for Determining Compliance With NJAC 7:27-3 Opacity Limits Utilizing Continuous Opacity Monitoring Systems (COMS)

The following describes the procedure for determining compliance with the opacity limits specified in NJAC 7:27-3. "Control And Prohibition of of Smoke From Combustion of Fuel" when a Continuous Opacity Monitor System (COMS) is utilized.

◆ Opacity Standard

The following are the opacity standards for NJAC 7:27-3:

Section 3.2(a) – No Visible Emissions

Section 3.2(b) - 20 %

Section 3.3(a) - 20 %

Section 3.4 - 40%

Section 3.5 - 20%

For any emission unit regulated by NJAC 7:27-3.2(a), for which the opacity limit is described as **No Visible Emissions (NVE)**, NVE is deemed to be opacity not greater than five (5) percent.* Any opacity minute where the opacity reading is greater than 5 % determined by the use of a COMS, will be a violative minute of an NVE limit.

- As per February 4, 1988 memo from Donald Patterson

◆ **Compliance Period**

The averaging period in which to determine compliance with the opacity limit , utilizing a COMS, in this subchapter, is a thirty (30) minute block average that is based on the clock hour.

(Example: 12:01 to 12:30, 1:31 to 2:00, ect)

◆ **Compliance Procedure**

The emission unit is allowed three (3) minutes in this 30 minute block, where the opacity from an emission source can exceed the opacity limit. The 3 minutes of violative opacity do not have to be consecutive, but anywhere in the 30 minute block. Upon the emission unit having a fourth minute of violative opacity (over the specified opacity limit) in the 30 minute block, the emission unit would be considered in violation of the particular opacity limit.

◆ **Compliance Procedure (cont'd)**

For documenting a violation in NJEMS, if the emission unit exceeds 3 minutes of opacity, over the opacity standard then the entire 30 minute block would be included in NJEMS as the period of violation.

◆ **Penalty Determination**

The highest opacity reading that occurred in the 30 minute block, would be included in NJEMS for determining the magnitude of the violation. The highest reading would be considered for all the opacity readings that occurred during the 30 minute block, including the 3 minutes that were initially excluded as part of the compliance determination. The compliance period allows 3 minutes to be excluded in the 30 minute block. But for penalty consideration the highest reading overall during the block, including the 3 minutes excluded, is used for the penalty determination.

DEFINITIONS

Definitions of most terms are located in each individual section of each Federal rule.

CEMS (Continuous Emission Monitoring System) - The total equipment required for the determination of a gas concentration or emission rate. The system consists of the following major subsystem sample interface, pollutant analyzer, diluent analyzer (if applicable) and data recorder/acquisitions system.

COMS (Continuous Opacity Monitoring System) - The total equipment required for the determination of the opacity of emissions which must meet the minimum requirements of Performance Specification One of 40 CFR - Part 60 and 40 CFR Part 51 - Reference Method 203.

EXCESS EMISSIONS - A period of time during which emissions of a regulated pollutant at a given source exceed the limit in units of the standard as specified in the conditions associated with the applicable permit and/or regulation.

DOWNTIME - The period of time when the source is producing emissions which are monitored by the CEMS/COMS but the monitors and/or recorders are not providing valid compliance emission data. This includes periods of Quality Assurance (QA) and Preventative Maintenance (PM) procedures, CEMS Calibration (Cal) that exceed 15 minutes in any one hour. (See definitions of Rolling and Block Averaging on Page 2 of the Instructions for Completing the EEMPR).

SOURCE - The production equipment and/or control equipment attached to and serving the production equipment for which the CEMS/COMS are monitoring emissions data.

APPENDIX C

NJDEP REGIONAL ENFORCEMENT OFFICE LOCATIONS

AIR POLLUTION CONTROL REGIONAL OFFICES

| <u>CENTRAL REGIONAL OFFICE</u> | <u>METROPOLITAN REGIONAL OFFICE</u> |
|--|--|
| PO Box 407 | 2 Babcock Place |
| Trenton, NJ 08625-0407 | West Orange, NJ 07502 |
| (609)584-4100 | (973)669-3935 |
| Fax No. (609)584-4119 | Fax No. (973)669-3942 |
| ENFORCEMENT OFFICER | ENFORCEMENT OFFICER |
| <i>Joseph DePierro</i> | <i>Byron Sullivan</i> |
| COUNTIES: Mercer | COUNTIES: Bergen |
| Middlesex | Essex |
| Monmouth | Hudson |
| Ocean | |
| Union | |
| <u>NORTHERN REGIONAL OFFICE</u> | <u>SOUTHERN REGIONAL OFFICE</u> |
| 1250 Route 66 | One Port Center |
| Parsippany-Troy Hills, NJ 07054 | 2 Riverside Drive |
| (973)299-7700 | Camden, NJ 08162 |
| Fax No. (973)299-7712 | (856)614-3601 |
| | Fax No. (856)614-3613 |
| ENFORCEMENT OFFICER | ENFORCEMENT OFFICER |
| <i>Michael Papp</i> | <i>Edward Choromanski</i> |
| COUNTIES: Hunterdon | COUNTIES: Atlantic |
| Morris | Burlington |
| Passaic | Camden |
| Somerset | Cape May |
| Sussex | Cumberland |
| Warren | Gloucester |
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| <u>CENTRAL REGIONAL OFFICE</u> | <u>METROPOLITAN REGIONAL OFFICE</u> |
| | Salem |